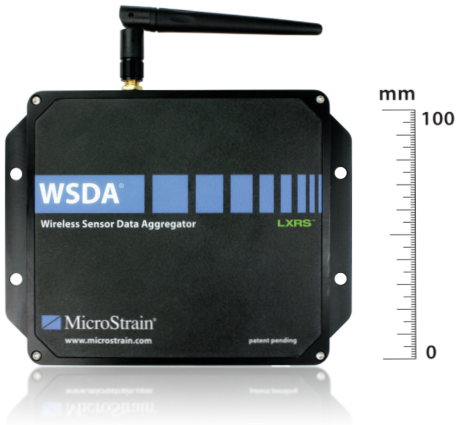
# WSDA® -1000 - LXRS™

Data Sheet

## Wireless Sensor Data Aggregator




## Introduction

The Wireless Sensor Data Aggregator (**WSDA®** -1000) is a single-board computer with Ethernet connectivity designed to operate as an integral part of **MicroStrain® LXRS™** Wireless Sensor Networks. The WSDA® -1000 is capable of collecting lossless data from a wide range of MicroStrain wireless sensor nodes operating in LDC or Synchronized sampling mode. The wireless sensor network can be set up and controlled remotely via LiveConnect and NodeCommander. Once set up, the WSDA® -1000 may operate in one of three distinct modes:

SensorCloud Enabled, LAN, and Standalone.

## Features & Benefits

### General

- lossless wireless communication protocol provides 100% packet success rate
- programmable communication range from 70m to 2,000m
- scalable wireless sensor networks supporting continuous, burst, and hybrid sampling modes
- time synchronized to +/- 32 microseconds
- Minimal setup required; collect data within minutes.
- Autonomously aggregates wireless sensor data.
- Supports a wide range of MicroStrain wireless sensor nodes transmitting in LDC or Synchronized Sampling modes.
- 2 GB non-volatile embedded flash for local storage.
- Command, control, and monitoring of a remote wireless sensor network from your PC.
- Web interface for system configuration.
- Three modes of operation: SensorCloud, LAN, Standalone
- Full industrial temperature range supported (-40 °C to 85 °C)

### SensorCloud Upload Enabled

- Seamlessly integrates with SensorCloud for world-wide data access and visualization.
- Includes a free basic SensorCloud account.
- Local storage is used for SensorCloud caching

## Applications

- Structural health monitoring
- Condition based monitoring of high value assets
- Environmental monitoring
- Food processes & cold-chain management

## System Overview

### WSN

At the heart of **MicroStrain®** LXRS™ Wireless Sensor Networks is the **WSDA®** -Base, or WSDA® -1000 which use our exclusive beaconing protocols to synchronize precision timekeepers embedded within each sensor node in the network. Each LXRS™ node in the network utilizes lossless communication protocols to provide 100 % data throughput under most operating conditions. The WSDA® coordinates data collection from all sensor nodes. Users can easily program each node on the scalable network for simultaneous, periodic, continuous, burst, or hybrid sampling modes with our **Node Commander®** software, which automatically configures network radio communications to maximize the aggregate sample rate

### SensorCloud Enabled

Optionally, the WSDA® -1000 seamlessly integrates with SensorCloud, a unique data visualization application, which allows the user to navigate through gigabytes of data within seconds and quickly drill down to points of interest. If enabled, sensor data is autonomously and securely pushed to SensorCloud periodically. Data is locally cached in case of Internet connectivity disruption. The WSDA® -1000 comes with a free basic account on SensorCloud.

### Local Storage on a LAN

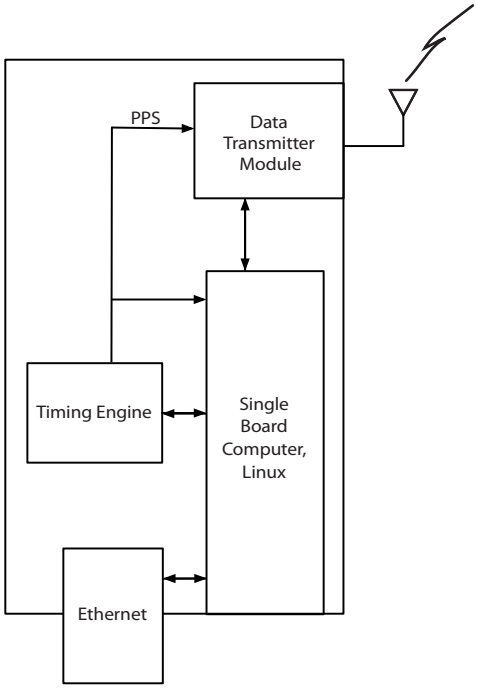
If SensorCloud upload is disabled, the WSDA® -1000 may act as an autonomous data logger on a LAN with a DHCP server, storing data to 2 GB embedded flash. Data can then be downloaded from the WSDA® -1000.

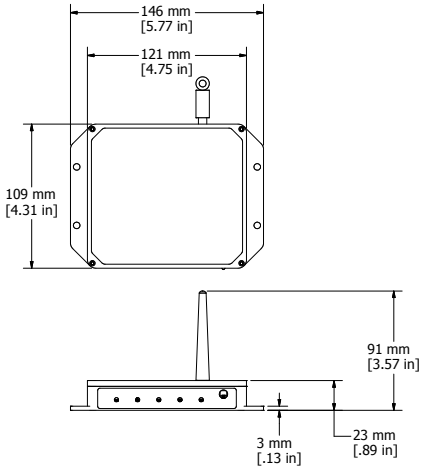
### Local Storage in Standalone Mode

If a LAN with a DHCP server is unavailable, the WSDA® -1000 may also operate on its own with a static IP, storing data locally on 2 GB embedded flash. With a crossover Ethernet cable, the user can download and clear data from the WSDA® -1000. This is useful in applications where network access is non-existent.

## Specifications

| | |
|---|---|
| CPU | Marvell® PXA270 |
| Operating system | Linux 2.6.21 kernal |
| CPU speed | 600 MHz |
| Internal memory | 32 MB flash, 128 MB flash |
| Data storage memory | Micro SD 2 GB |
| Connectivity | IEEE 802.3 Ethernet, 10/100, IEEE 802.15.4 wireless, optional external cell modem |
| Accessibility | HTTP, HTTPS TCP/IP socket |
| IP assignment | DHCP |
| Remote data synchronization | optional - periodically uploads data to secure portal (SensorCloud®), requires internet connection or cellular modem |
| Firmware upgrade options | upgradable via web |
| Node support | **V-Link®**-mXRS™, **SG-Link®**-mXRS™, **G-Link®**-MXRS™, **DVRT-Link™**-mXRS™, **TC-Link®**-6CH-mXRS™, TC-Link®-1CH-mXRS™, **EH-Link®**, SG-Link® OEM-S, TC-Link® OEM, all legacy 2.4 GHz wireless nodes |
| Communication cable | 10 foot CAT 6 Ethernet |
| Power supply | universal 12 volts DC |
| Power supply range | 7.0 to 36.0 volts DC |
| Power consumption | max - 2000 mW, typical - 1400 mW |
| Radio frequency (RF) transceiver carrier | 2.4 GHz direct sequence spread spectrum, license free worldwide (2.405 to 2.480 GHz) – up to 16 channels, radiated power programmable from 0 dBm (1 mW) to 16 dBm (39 mW) |
| RF data packet standard | IEEE 802.15.4, open communication architecture |
| Range for bi-directional RF link | 16 dBm (39 mW) Extended Power with range up to 2 kilometers (not available in Europe)<br>10 dBm (10 mW) Standard Power with range up to 1 kilometer<br>0 dBm (1 mW) Low Power with range up to 70 meters |
| Node synchronization | 1 Hz beacon provides +/-32 microsecond node to node synchronization |
| Status LEDs | multi-color LEDs signal activity status |
| Operating temperature | -40 °C to +85 °C |
| Dimensions | 146 mm x 109 mm x 22 mm without antenna |
| Weight | 305 grams with antenna |
| Enclosure material | black anodized aluminum |
| Software | **Node Commander®** Windows XP/Vista/7 compatible |
| Software Development Kit | includes Data Communication Protocol and sample code |
| FCC ID | XJQMSLINK0001 |
| IC ID | 8505A-MSLINK0001 |
| MIL-SPEC | MIL-STD-461F(RE102) |

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Patent Pending

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Specifications are subject to change without notice. 1.01g
8400-0021 rev. ___